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Item 4 of the provisional agenda*

OUTCOME OF THE CONFERENCE: DRAFT STATEMENT OF PRINCIPLES AND COMMITMENTS AND GLOBAL PLAN OF ACTION

Letter dated 31 January 1996 from the Permanent Representative of Egypt to the United Nations addressed to the Secretary-General

From 10 to 14 December 1995, the Arab Republic of Egypt hosted an International Seminar on Geographic Information Systems (GIS), City Sustainability and Environment, in Cairo, Egypt.

The Seminar was organized by the Department for Development Support and Management Services of the United Nations Secretariat in cooperation with the Organization of Islamic Capitals and Cities (OICC), and was included in the Habitat II's Calendar of Events entitled "The Learning Years".

I have the honour to transmit to you the report of the Seminar (see annex) and would appreciate if you could arrange for the report to be circulated as an official document for consideration by the Habitat II Preparatory Committee at its third session under item 4 of its provisional agenda.

(Signed) Dr. Nabil ELARABY
Ambassador
Permanent Representative

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Annex

REPORT OF A UNITED NATIONS INTERNATIONAL SEMINAR ON GEOGRAPHIC INFORMATION SYSTEMS (GIS), CITY SUSTAINABILITY AND ENVIRONMENT

CONVENED BY THE UNITED NATIONS DEPARTMENT

FOR DEVELOPMENT SUPPORT AND MANAGEMENT SERVICES (UN/DDSMS)

UNDER THE AUSPICES OF THE GOVERNMENT OF THE ARAB REPUBLIC OF EGYPT

and in cooperation with

THE ORGANIZATION OF ISLAMIC CAPITALS AND CITIES (OICC)

Cairo, Egypt

10 - 14 December 1995

BACKGROUND

Urban population is increasing at an alarming rate, causing urban management to become of major concern to municipalities, central governments, and the international community. With the growing importance of cities in national economies, Geographic Information Systems are bound to play a crucial role in the sustainable management of cities. The United Nations estimates that by the year 2005 more than 50 per cent of the world's population will live in urban areas, and by the year 2025 the figure will reach 61 per cent. Of the 26 urban agglomerations projected to contain more than 10 million inhabitants by the year 2010, seven now contain more than 30 per cent of their country's urban population, and all are situated in developing countries. At present, 288 urban agglomerations in the world have more than one million inhabitants. This implies that the approach adopted to tackle the increasingly complex and interrelated urban issues will exert a considerable influence, not only on growth and sustainable development, but also on the social well-being and stability of nations in the future.

The effective and efficient management of urban areas is a global concern, and the support of local authorities requires continued consideration and utmost effort.

The needs of today's cities cannot be served effectively by traditional development policies, programmes, nor by technologies

of the past. The development of environmental management capacity for the 21st century requires the adoption of new concepts and approaches to modernization, decentralization and cooperation. Interaction and cooperation between local and national authorities, between the private and public sectors, between national and regional organizations, and even among agencies of the UN, are needed in order to promote sustainable development.

The role of Geographic Information Systems in attaining sustainable development of urban environments is fundamental. As cities have grown, the spatial and temporal relationships within the cities and beyond into their hinterlands have grown more complex. The scale of the problems facing urban centres lies beyond the capacity of conventional structure planning approaches and related institutions. Many more variables, particularly social and environmental aspects of urban life, have come into play. Integrating, updating and analysing the data to model urban environments and plan and operate their physical structure and municipal services ultimately requires the adoption of GIS.

However, the adoption of GIS is not an end in itself. Not only does GIS act as an entry point for technology transfer, but more importantly, it can act as catalyst for integrated planning and resource management. By requiring the compilation of multi-sectoral databases, they force capacity building in integrated planning and resource management by bringing together previously

unrelated municipal agencies to share data and analysis in a holistic view of the urban environment.

All of these aspects of GIS fit squarely within HABITAT's Global Plan of Action which seeks to promote development of sustainable human settlements and build the capacity, cooperation and coordination required to implement workable solutions.

The HABITAT Global Plan of Action under section D, "capacity building and institutional development" emphasizes the need to empower all key actors to achieve capacity building and stresses the importance of partnership among the private sector, non-governmental organizations, national and international institutions, as well as governments. It calls for sharing good practices and innovative approaches to sustainable human settlement management. It further reaffirms the need for the use and transfer of environmentally-sound technologies as one of the prerequisites for sustainable human settlement development. The Seminar concentrated on GIS as one of these technologies and highlighted the issues that affect its ability to contribute to human settlement management and effective decision-making. It stressed the need for action by the diversity of actors to encourage, promote and facilitate the use of GIS at all levels and made specific recommendations in this regard.

The United Nations Department for Development Support and Management Services, in cooperation with the Organization of Islamic Capitals and Cities (OICC), an international NGO with category I consultative status with ECOSOC, decided to hold an International Seminar on Geographic Information Systems, City Sustainability and Environment. Under the auspices of the Egyptian Government, represented by the Ministry of Local Administration and the Governorate of Cairo, the Seminar took place at the Helnan Shepheard Hotel in Cairo, Egypt, from 10 to 14 December 1995. The main partners of the Seminar were the Environmental System Research Institute (ESRI), USA; Intergraph Corporation of USA and Sokkia Technology Inc., of Japan. Other partners who provided in-kind contributions represented various public and private establishments from North America, Europe, and the Middle East. Over 250 participants from central and local governments, NGO's, research institutions, universities, the private sector in 20 countries attended the Seminar.

This event was organized within the framework of the preparatory process for HABITAT II and is included in the HABITAT II Calendar of Events entitled, "The Learning Years."

The purpose of the Seminar was to assist in the transfer of knowledge and technology in Urban Geographic Information Systems (U/GIS) for their expanded application in developing countries to facilitate better protection of the urban environment, human

settlements and management of municipal operations and maintenance. Its immediate objectives were: to exchange experiences and ideas about the needs in the field of urban/GIS through case studies of cities of OICC; to inform and demonstrate to 100 participants the latest technology, hardware, software and methods currently used for Urban Geographical Information Systems and about the basic requirements of an Urban GIS, the basic data base requirements as well as geographical (mapping) requirements; to evaluate these technologies and methods; and to stimulate interest toward creating, strengthening and modernization of municipal geographical information systems in developing countries as a means of promoting sustainable development and preservation of existing resources.

The United Nations, through DDSMS, wishes to express its deep appreciation to the Egyptian Government and to tne Organization of Islamic Capitals and Cities for their most valuable support to the Seminar, including the gracious hospitality and arrangements for the visit to the Cabinet of Ministers' Information and Decision Support Centre. UN/DDSMS also extends its gratitude to the three partners for their most generous contributions.

INTRODUCTION

In addressing the topic of the Seminar, the United Nations Department for Development Support and Management Services (UN/DDSMS) and the Organization of Islamic Capitals and Cities (OICC) have concentrated on the identification of the linkages between GIS technology, the sustainable development of cities and the protection of the environment. The Seminar addressed GIS state-of-the-art, administrative and managerial aspects and GIS applications in those fields that are considered to be of highest priority. A total of thirty-six technical papers and city reports relevant to these issues were presented at the Seminar demonstrating a wide scope of the latest GIS technology and applications in both developed and developing countries. These documents were prepared and presented by representatives from ESRI, Sokkia, Intergraph; international experts selected by UN/DDSMS, as well as officials from cities throughout the world. Each session was followed by a general discussion.

At the invitation of the Egyptian Government, the participants also visited the Cabinet of Ministers' Information and Decision Support Centre (IDSC), and benefited from the GIS capability of the Centre, which is still in its initial stages of development.

A pre-seminar workshop was held and covered the following themes: GIS Database Construction with GPS; Using GIS for

Planning, City Sustainability, and Environmental Analysis; and GIS Technologies for Local Governments. The contents of the three workshops were structured to address the development and application issues of the GIS/GPS technologies.

The opening session of the Seminar was addressed by H.E. Dr. Mahmoud Sherif, Representative of the Egyptian Prime Minister and Minister of Local Administration; H.E. Dr. Venice Gouda, Minister of Scientific Research in the Arab Republic of Egypt; H.E. Dr. A.H. Koshak, Secretary-General of OICC; and Ms. B. Labonne, Director of the Division for Environment Management and Social Development (DEMSD/UN-DDSMS).

The present report concentrates on a summary of the issues, the conclusions and recommendations of the Seminar. The latter, which reflect the active participation of city managers from developing countries, were finalized by separate working groups before being read, discussed, and approved by consensus at the concluding session of the Seminar.

MAJOR ISSUES AND CONCLUSIONS

Over the course of the five-day meeting, the following key issues that affect the ability of GIS to contribute to effective decision making, particularly in developing countries, were identified:

- Lack of adequate and consistent funding for the planning, implementation, and maintenance of GIS in developing countries and cities;

- Political awareness of the value of geographical information (GI) for decision support is relatively limited and often difficult to achieve;

- Educational opportunities are currently limited within both the university environment, and among professionals of all sectors of the economy at the national and local levels;

- Access to data and information is affected by a variety of existing legislation and policies;

- Many organizations are making use of GIS, but few have the ability, alone, to collect and maintain all of the data required. The "enterprise" or shared data management approach to GIS implementation requires cooperation and

development of standards among agencies, levels of government, and countries which is often difficult to achieve;

- Many GIS projects focus on basic data conversion instead of end users;

- Proprietary data formats inhibit access to data;

- The inaccessability of digital geospatial data is a limiting factor. Data are expensive to collect and maintain, and are often out-of-date (GIS works better only with reliable data);

- Successful applications of GIS require innovative and effective planning and training;

- There is a proliferation of GI specifications within individual agencies, but few standards contributing to integrating data and data sharing, yet it is recognized that the benefits of data sharing exceed the benefits of a series of single projects/single purpose data collection efforts;

- Local approaches to the use of GIS often fail to acknowledge the role that data may play in national, regional, or global

assessments. Data collected and used locally may be difficult to extrapolate over larger areas;

- Open systems will promote the affordability and use of GIS.

It is widely recognized that GIS technology provides a common language for sustainable and environmental management of urban centres and that the establishment of common principles is a necessity for a successful system implementation. This includes the development of a strategic plan, building strong political support at the project's outset, identifying realistic goals, producing early and meaningful products from a phased implementation, establishing standards of data to minimize redundancies, and building partnerships within the community, which includes other users and the educational sector.

The Seminar highlighted the capability of advanced technology to integrate information and provide dynamic visual models of the long-term outcomes of current decisions. For the first time GIS provides local decision makers with a powerful technology that places local decisions in a global context. It is the only technology that can integrate all information necessary for effective decision support as communities face the unprecedented challenges of sustainability. These technologies are within the reach of all developing countries as the newest systems are PC based and may be purchased incrementally. Further declines in

prices will combine with continuing advances in the underlying technologies to make this a development tool for all jurisdictions, i.e., the efficient use of Global Positioning System (GPS) and Remote Sensing (RS), Digital Photogrammetry, and other relevant technologies, may reduce the cost of and enhance the process of data capture for geographic information applications;

GIS brings a powerful technology to the understanding of the complete relationship between urban and rural sustainability issues. The sustainability of each of the sectors is intertwined with the other.

SEMINAR RECOMMENDATIONS

Each of the sessions of the Seminar has generated major discussions and a set of recommendations. These recommendations have been endorsed by the participants at large and thus reflect the views of the Seminar on GIS, City Sustainability and Environment. They stressed the need for action by a diversity of organizations to encourage, promote, and facilitate the use of GIS for sustainable decision-making. It is strongly advised that the following recommendations be included in section D, of the HABITAT Agenda entitled, "Capacity building and institutional development."

Non-governmental organizations (NGO's) should:

- encourage their members and their national governments to provide GI (geographical information) education, contribute to sharing of GI, and promote the use of GIS;

- provide access to the GIS and geospatial data standards being produced globally;

- contribute to the development of a network of GI professionals to encourage the exchange of ideas and techniques through international networks;

- promote networking among its constituent local organizations and with other similar local organizations;

- create a mechanism for data sharing (clearing house, metadata);

- encourage their member cities to establish partnerships with cities using Global Positioning Systems (GPS) and Remote Sensing (RS) technologies.

The United Nations in general, and the United Nations Department for Development Support and Management Services (UN/DDSMS) in particular, should:

- Collect and document GIS standards;

- Enlarge the provision of GIS expertise to their constituent members;

- Continue to sponsor GIS awareness, technology, and organizational impact workshops in various regions and countries of the world;

- Promote sharing of GI by requiring that geospatial data development efforts funded by the UN result in documented and accessible data sets;

- Assist in the creation of a common fund for GIS coordination efforts at regional and national levels (that could be used by these regions or nations for local coordination and GIS application promotion;

- Assist in the dissemination of publications on successful use of GIS;

- Encourage the participation of private, national and international funding agencies to ensure that adequate financial allocations are provided for GIS application promotion in developing countries.

National Governments should:

- Assist in the promotion of "city exchange programmes" between and among nations to benefit the promotion of successful GIS enterprises. This should include the education on both the technological and institutional aspects of GIS;

- Provide documentation of projects and the use of GIS technology through common distribution channels such as the Internet or UN publications;

- Assist cities to create an "Adopt-a-developing nation" programme or use the "Sister City" programme to promote successful application of GIS and use through sponsored training and technology transfer. This might include the development of multilateral, short and medium-term partnerships;

- Sponsor international workshops on the development of data-sharing standards and address what standards are needed, how they are to be developed and implemented, and who is responsible for standards maintenance;

- Provide access to data which may be useful to their GIS efforts (e.g. satellite data, DCW, etc.);

- Assist in the creation of transnational GIS networks which deals with specific thematic and regional issues;

- Vendors should adapt to industry data exchange format and explore direct reading technologies;

- Encourage and support partnerships with concerned parties in the field of GIS, with the objective of facilitating GIS enterprise funding;

- Create GIS awareness and coordination groups among different levels of government and agencies that will benefit by use of the GIS technology;

- Sponsor internal meetings and workshops that could be attended by international experts on the use of GIS technology, and issues of data collection, integration and management;

- Create national standard-setting bodies to facilitate the process of data standardization.